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Application No. : **2,454,483**
Owner : SAMSUNG ELECTRONICS CO., LTD.
Title : EQUALIZING METHOD AND APPARATUS FOR SINGLE
CARRIER SYSTEM HAVING AN IMPROVED EQUALIZATION
PERFORMANCE
Classification : H04L 27/01 (2006.01)
Your File No. : **08898204CA**
Examiner : Sajith Bandaranayake

YOU ARE HEREBY NOTIFIED OF :

- A REQUISITION BY THE EXAMINER IN ACCORDANCE WITH SUBSECTION 30(2) OF THE *PATENT RULES*;
- A REQUISITION BY THE EXAMINER IN ACCORDANCE WITH SECTION 29 OF THE *PATENT RULES*.

IN ORDER TO AVOID **MULTIPLE ABANDONMENTS** UNDER PARAGRAPH 73(1)(A) OF THE **PATENT ACT**, A WRITTEN REPLY TO EACH REQUISITION MUST BE RECEIVED WITHIN **6** MONTHS AFTER THE ABOVE DATE.

This application has been examined as originally filed.

The number of claims in this application is 14.

A search of the prior art has revealed the following:

Reference Applied:

Patent Documents:

D1: CA 2 274 173

17 Jan 2000

Zhang et al.

D1 discloses a multiphase and/or multiple amplitude receiver, such as a 64/256 quadrature amplitude modulation (QAM) receiver, wherein a moving window adaptive decision feedback equalizer (DFE) is provided according to the adaptive equation $C_n(k+1) = C_n(k) - W(k)E(k)X_n(k)$, where delta is step size, C_n is the tap value of tap number n , $E(k)$ is the error output at time k , $X_n(k)$ is the received signal for pre-cursor taps (FFE) and past decision output for post-cursor taps (DFE), and $W(k)$ is the sliding window function of time k . In the adaptation process, some coefficients are fixed while other taps are being adapted. In particular, the adaptation is focused on a group of taps which correspond to received echoes. By only adjusting these taps, no interference

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or noise is introduced to the decision making device in the digital receiver and therefore, the effect of noise and echoes on the adaptation control is substantially reduced.

The examiner has identified the following defects in the application:

Obviousness

D1 discloses the characteristics of an apparatus and method of equalization in a single carrier system as set forth in claims 1, 4, and 9:

- a multi-path prediction unit for predicting multi-path of a received signal (figure 2, page 5 line 3 - page 6 line 14, and page 14 line 19 - page 15 line 8); and
- a filter unit for filtering the multi-path by updating coefficients of the filter taps (figure 2, page 5 line 3 - page 6 line 14, and page 14 line 19 - page 15 line 8).

Although D1 does not disclose a section setting unit per se, D1 discloses that the taps are selectively responsive to a processor, such that only those taps which correspond to received echoes are adjusted to update the coefficients associated therewith (page 5 line 3 - page 6 line 14). Thus, D1 does disclose a processor with equivalent functionality as that of the section setting unit of the instant application.

D1 does not disclose a repeat setting unit per se, however, D1 discloses adaptation focused on a group of complex coefficients, which correspond to received echoes (page 19 line 13 - page 20 line 5). Since the taps are selectively responsive to the processor such that only those taps which correspond to received echoes are adjusted to update the coefficients associated and the process is iteratively repeated, D1 does disclose a processor with equivalent functionality of the repeat setting unit of the instant application.

Additionally, D1 discloses past decision output for post-cursor taps (DFE) (page 19 lines 5 - 13), which is equivalent to a feed forward (FF) unit for filtering pre-ghosts from among the predicted multi-path, and a feed back (FB) unit for filtering post-ghosts from among the predicted multi-path.

Therefore, the subject matter of claims 1, 4, and 9 lacks an inventive step over the prior art and is deemed obvious.

Dependent claims 2-3, 5-8, and 10-14 do not define any additional elements or characteristics that would distinguish them from D1 and the common general knowledge in the art, thus the subject matter of these claims lacks an inventive step over the prior art and is deemed obvious.

Therefore, claims 1-14 do not comply with section 28.3 of the *Patent Act*. The subject matter of these claims would have been obvious on the claim date to a person skilled in the art or science to which they pertain, in view of D1 and the common general knowledge of any person skilled in the art of equalization in single carrier systems.

Indefiniteness

Claim 14 is indefinite and does not comply with subsection 27(4) of the *Patent Act*. The expression "the method as claimed in claim 9, wherein, in step a," (claim 14, line 1) is unclear and causes confusion, as claim 9 does not contain steps (a) or (b); instead it contains steps (1), (2), (3), and (4).

Claims

The term "step a" in claim 13, line 3 appears to be improperly phrased and should be changed to "step (a)".

The term "step b" in claim 13, line 4 appears to be improperly phrased and should be changed to "step (b)".

Description

In accordance with subsection 81(2) of the *Patent Rules*, all documents referred to in the description of an application must be available to the public. Reference to the document on page 1, paragraph [01], specifically reference to "Korean Patent Application No. 10-2003-0007589" must be deleted or replaced by its corresponding patent number or publication number.

A statement in an application, such as found on page 1, paragraph [01] which incorporates by reference any other document, does not comply with subsection 81(1) of the *Patent Rules*.

Paragraph [01] of page 1 of the description does not appear relevant to the prosecution of this application in Canada and should be removed.

In view of the foregoing defects, the applicant is requisitioned, under subsection 30(2) of the *Patent Rules*, to amend the application in order to comply with the *Patent Act* and the *Patent Rules* or to provide arguments as to why the application does comply.

Under section 34 of the *Patent Rules*, any amendment made in response to this requisition must be accompanied by a statement explaining the nature thereof, and how it corrects each of the above identified defects.

Section 29 of the Patent Rules requisition

Under section 29 of the *Patent Rules*, the applicant is requisitioned to provide:

- an identification of any prior art cited in respect of the European Patent Office application describing the same invention on behalf of the applicant or on behalf of any other person claiming under an inventor named in the present application, and the patent number, if granted, under paragraphs 29(1)(a) and 29(1)(b) of the *Patent Rules*;

- a copy of the related non-patent documents cited during the prosecution of this application, under subsection 29(1) of the *Patent Rules*;
- alternatively, if the applicant did not apply for a patent in a foreign country, this must be stated.

To satisfy this requisition, applicant should provide all the preceding information or documents, or provide in accordance with subsection 29(3) of the *Patent Rules* a statement of reasons why any information or document is not available or known.

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Patent Examiner
819-934-6754